LISBOA SCHOOL OF ECONOMICS & MANAGEMENT

MASTER IN INFORMATION SYSTEMS MANAGEMENT

MASTERS FINAL WORK

DISSERTATION

CRITICAL SUCCESS FACTORS IN A MULTIPLE ERP SYSTEMS INTEGRATION PROJECT: A CASE STUDY IN A MULTINATIONAL CORPORATION

PEDRO MIGUEL MENDES PINTO DE ALMEIDA

SEPTEMBER - 2013

MASTER IN INFORMATION SYSTEMS MANAGEMENT

MASTERS FINAL WORK

DISSERTATION

CRITICAL SUCCESS FACTORS IN A MULTIPLE ERP SYSTEMS INTEGRATION PROJECT: A CASE STUDY IN A MULTINATIONAL CORPORATION

PEDRO MIGUEL MENDES PINTO DE ALMEIDA

SUPERVISORS:

PROFESSOR PEDRO TEIXEIRA ISAÍAS, PH.D.
PROFESSOR CRISTIANE DREBES PEDRON, PH.D.

SEPTEMBER - 2013

Abstract

Enterprise Resource Planning (ERP) systems have emerged widely in global, multinational corporations in the 1990s. As of today, these corporations ERPs are in a considerable higher degree of maturity and the types of implementations that they face are different. As such, it is important to understand how the Critical Success Factors (CSF) of these types of projects are different from the CSF of ERP adoption Projects. This research is focused on an example of such projects: an integration of five different ERP systems into a single ERP system in a utilities multinational company in Portugal. To achieve the objectives of this study it was used a qualitative case study that involved the collection of qualitative data by a relevant number of interviews made to a set of participants with direct responsibilities in the Project within the several countries involved.

It is concluded that despite that all the factors remain important, there are some factors that are considered not as critical and others are more critical than in a project of ERPs adoption. It was also concluded that in some of the most critical success factors, the reasons and the reality behind that criticality is different.

Keywords: Enterprise Resource Planning, Critical Success Factors, Multinational

Resumo

Os sistemas Enterprise Resource Planning (ERP) emergiram de forma significativa nas empresas multinacionais na década de 90. Nos dias de hoje os ERPs destas organizações encontram-se numa fase de maior maturidade e os tipos de implementações com que lidam são diferentes. Por isso é importante perceber como é que os Factores Críticos de Sucesso (FCS) destes tipos de projectos, diferem dos FCS dos Projectos de adopção de ERP. Esta pesquisa foca-se num exemplo deste novo tipo de projectos: uma integração de cinco ERPs diferentes em apenas um único ERP, numa empresa Multinacional portuguesa da área das Utilities. Para atingir os objectivos deste estudo, foi utilizado um caso de estudo que envolveu a recolha de dados qualitativos através de entrevistas realizadas a um conjunto de participantes com responsabilidades directas no Projecto referentes a todos os países envolvidos.

Foi concluído que não obstante todos os factores terem sido considerados importantes também neste tipo de projecto, existem alguns factores que não são considerados tão importantes e outros que são considerados mais importantes do que acontece num projecto de adopção de ERP. Foi também concluído que em alguns dos factores mais críticos bem como respectivos motivos e a realidade por detrás dessa criticidade são diferentes.

Palavras-chave: *Enterprise Resource Planning*, Factores Críticos de Sucesso, Multinacional

Acknowledgement

Firstly, I thank God for all the strength, will and health, conceding me the opportunity to succeed in life.

No one walks alone on the journey of life. This research project would not have been possible without the existence and support of many people.

I would like to express my deep sense of gratitude to my supervisors Prof. Pedro Teixeira Isaías and Prof. Cristiane Drebes Pedron who were abundantly helpful and offered invaluable assistance, support and guidance.

I thank also the Alpha Company for accepting the challenge, for their availability and for conceding me all the relevant information that allowed me to do this research project.

I also kindly thank all the moral support and advice from all my friends.

Finally and foremost I would like to express my deep love and gratitude to my beloved wife and daughter, and all my family for their understanding and endless love, through the duration of my studies. I give a special reference to my beloved parents to whom I´m forever indebted for the great sacrifice, effort and true love through all my life not only on my education, but also in everything they taugth me on how to be a decent human being. You are my pride and inspiration. This is for you. You are the best.

List of Acronyms

BPR – Business Process Re-engineering

CA – Chief Accountant

CIO – Chief Information Officer

CSF – Critical Success Factors

ERP – Enterprise Resource Planning

HAFC - Head of Administration Finance and Control

IS – Information Systems

IT – Information Technology

ITR - Information Technology Responsible

OECD – Organization for Economic Co-operation and Development

PD – Project Director

PM – Project Manager

USA – United States of America

Contents

List of Tables

1. Introduction

ERP systems are integrated and packaged business softwares that allow organizations to enable their efficiency in their processes and that provide a more effective way to run them regarding the organizations information processing needs (Nah et al., 2001).

These kinds of systems have the potential to allow organizations to benefit in a great variety of perspectives like the operational, managerial, strategic, organizational and others (Chang et al., 2008).

ERP systems total cost of ownership is expensive, and its implementation can be very complex, besides impacting the entire organization (Scott, 1999). Given this importance and considering the maturing and long-term use of ERP, different challenges and different types of projects rises within the ERP context, which should be addressed and understood. As of today, corporations and its ERPs are in a considerable higher degree of maturity and the types of implementations that they face, are in fact different. One example for a multinational corporation is to integrate new subsidiaries that already have their ERPs implemented. That might origin for instance, the integration of different ERPs.

These new types of implementations are still very important to the organizations, given the value of investment and impact. Being different types of implementations with different types of complexities, it is important to understand how the CSFs to these projects are different from the adoption of ERP CSFs, widely researched over the past years.

Additionally, facing a Multinational Corporation, this kind of integration means different countries realities, significant distance to the corporative centers and also different cultures. These are other relevant factors to consider and research.

Generally, the great focus has been on the critical success factors for a successful ERP adoption. These factors have been examined from a great variety of perspectives and factors like country specific, cultural or industry-specific have been taken in consideration (Grabski et al., 2011). Despite the great effort, there are still many questions that need to be answered. The great potential lies on the possible micro-level approaches and needs. One example is the need to investigate further the later phases of the ERP lifecycle (Grabski et al., 2011). When knowing that CSF interact (Grabski & Leech 2007), it is important to know if there are changes in the existence and/or relevance of CSF when changing the context or the lifecycle phase of the implementation. Important questions are rising on this matter. Some examples are:

"…do CSFs of a first-time implementation differ from the CSFs for firms with mature ERP systems undertaking new module deployments or vendor changes?..." (Grabski et al., 2011, p.43).

"...is whether there are different CSF or different priorities among CSF when an organization upgrades or converts to a different ERP system? …such research could help specify when and how the CSFs should be applied in ERP reimplementation, providing a significant contribution to the literature" (Grabski et al., 2011, p.43).

The objective of this research is to answer to the following question:

Considering a multinational organization, how are the CSFs for an integration of different ERP systems different from the ERP adoption scenario?

In order to answer this question, a case study was conducted in a utilities multinational company in Portugal.

This masters final work is divided into 5 topics:

In the first one, a brief description of the theme and its relevance, research questions and main objectives, are presented.

The second one presents a literature review on what has been already written about ERP, CSF on the ERP adoption and multinational organizations.

In the third one, it is described how the research is conducted and also how is the methodology applied.

In the fourth one, the Alpha Company and Project Beta are described, as well as the analysis and results interpretation.

In the last topic it is presented the research conclusions, the main contributions on these matters from the theoretical perspective and to all the organizations that might run an integration of ERPs into a single one. It is also presented a suggestion on further possible researches as well as the research limitations.

2. Literature Review

A literature review search was conducted regarding the concepts of ERP, CSFs in the adoption of ERP and on Multinational Organizations. In this chapter, it will be presented the most relevant existing theoretical contents on these matters.

2.1. Enterprise Resource Planning

Enterprise Resource Planning (ERP) systems have emerged widely in global, multinational corporations in the 1990s. These implementations were oriented to the first time integration of complex processes within the corporations (Grabski et al., 2011).

The complexity to these implementations was related not only to the ERP concept itself that was new, but also because it really represented a significant amount of challenges to these organizations (Chang et al., 2008).

ERP systems have their origin in the early accounting systems as they followed the trend of being the foundation for the connection of different participants to the accounting process in a collaborative perspective. (Deshmukh, 2006).

As of today, the adoption and usage of ERP systems can be related to a diversity of typical possible motivations as: regulatory compliance, integration of the different operations and activities within the organization, management decision support, business process re-engineering and other types of business needs, and also the need to upgrade old legacy systems. (Robey et al., 2002).

Many benefits have been pointed to the usage of ERP systems. These were mainly related with the usage of an integrated system and processes, instead of using broken and fragmented legacy systems. (Robey et al., 2002).

From a definition point of view, ERP systems can be seen as integrated systems that are designed trough software modules regarding all the functional areas in an organization like accounting, controlling, human resources, manufacturing, sales and others. The supported processes are integrated and the functional system modules are linked to a common database (Robey et al., 2002). ERP Systems can also be defined as being modularly packaged business softwares that allow an enterprise to automate and integrate its business processes, share more easily information within the organization and doing it in a real-time environment (Nah et al., 2001). By that, the organization can manage more efficiently and effectively its resources (products and services, personnel,

capital assets, etc.) through a better support of its information processing needs. (Nah et al., 2001).

From an individual perspective, the ERP system is very demanding not only from the usability point of view, but also from the business processes knowledge that it is related to its usage (Sein et al., 1999). The individuals are impacted through the necessary adjustments of job roles and new processes knowledge, because of process integration and dependencies (Kang & Santhanam, 2003).

2.2. Critical Success Factors

Critical Success Factors (CSF) can be defined as being a limited number of factors that if well applied, guarantee the organization the success of a given project. If the results of these main factors are not ensured, all the effort involved might be lost (Rockart, 1979; Howell, 2010; Boyton & Zmud, 1984).

These factors include the vital issues and areas of concern to the organization present and future activities. The CSF methodology makes explicit the key-areas that dictate the organization's success that aid the management of those areas (Boyton & Zmud, 1984).

There has been a great diversity of research focusing on the ERP implementation process and its critical success factors. Technology it self does not seems to be the only problem or even one of the greatest problems in the ERP implementation projects. What seems to be the most appropriate is the existence of a combination of different factors that are not just related with technology but also with people, organizational culture and business processes. A review of the existent literature was made, and the most relevant factors were classified in four different dimensions: People, Organizational Culture/Change Management, Business processes and Technology.

2.2.1. People

- **Top Management Support**

Top Management support is one of the most critical success factors for any IT (Information Technology) Project (Bingi et al., 1999) including ERP implementation Projects (Finney & Corbett, 2007; Al-Mashari et al., 2003; Ang et al., 2002; Somers & Nelson, 2001). ERP implementations are particularly relevant because of its global impact within the organizations. These implementations transform the organizations and such a project must be clearly and strongly supported by the top management. This commitment should be visible to all of the organization and to all of the project stakeholders. Given the strategic importance of this type of implementation, the top management should be involved in all the big decisions and orientations of the project and the involvement with the project should be constant and visible, in order to provoke an overall organizational commitment (Bingi et al., 1999).

- **Project Champion**

The Project champion is a facilitator and a team motivator that has the extremely important role of creating enthusiasm, and converge the team into the same common goals (Al-Mashari et al., 2001; Murray & Coffin, 2001; Somers & Nelson, 2001). This is a particular important leadership role, given also the importance and global influence of an ERP project, and given the uncertainty that such projects might have (Clemons, 1998).

As a fully participant in the project, the Project Champion must be an integrant part of all the project phases and must control its activities, besides the close monitoring of the project's progress (Esteves & Pastor, 2002b).

- **Project management**

Project management consists on the definition and execution of all the activities that will make possible the insurance that the implementation will occur as planned (Esteves & Pastor, 2002a; Zhang et al., 2005).

The project management concerns are related mainly with the need of having clearly assigned and controlled activities and milestones, a well defined and controlled scope, and the management and evaluation of possible changes to the original project scenario dealing with its possible risks (Holland et al., 1999; Somers & Nelson, 2001). Considering the organizational scope of an ERP implementation, and given the multiple organizational, human and political issues involved in this type of project environments, the management skills assume also a great deal of importance in the project success (Ryan, 1999).

- **Communication plan**

The communication plan represents the way to ensure that an open communication between all the stakeholders in the Project exists (Françoise et al., 2009).

The key messages of the project, its goals and expectations, must be communicated among the entire project stakeholders through all the organization in order to improve the projects achievements themselves (Al-Mashari et al., 2003; Falkowski et al., 1998; Rosario, 2000; Wee, 2000).

The way to ensure this effective communication starts with the creation of a communication plan (Kumar et al., 2002). This communication plan is a way to formalize all the exchanges (from all types) of information that must occur within the project stakeholders that will ensure that each one has access to all the appropriate project information (Françoise et al., 2009; Yusuf et al., 2004).

- **Project team**

This factor is also critical to an ERP project. The project team work and composition is very important since these employees will be the main actors of the project (Bingi et al., 1999; Nah et al., 2001). The team should have the best skills within the organization (Bingi et al., 1999; Falkowski et al., 1998; Rosario, 2000; Wee, 2000) and its elements should be allocated to the project in a full-time basis (Shanks & Parr, 2000; Shanks et al., 2000; Siriginidi, 2000b). Since the project affects different departments in the organization, the team should be multidisciplinary in order to understand and answer the different department needs (Kumar et al., 2003).

- **Training**

Despite all the effort that might have been made in other previous phases of the project, an inadequate training can mean the ERP system failure (Gupta, 2000; Kelley et al., 1999). The investment made in the training phase is often underestimated but this is a critical matter in an ERP project (Jarrar et al., 2000; Nah, 2006; Kumar et al., 2003; Tinham, 2006). This training is very complex, and it should be rigorous. It is related to the business processes that they support, and many times these processes were previously re-engineered. As such, many times not only the systems issues are in stake, but job redesign issues are also involved, which make this exercise much more critical and complex. (Bingi et al., 1999; Finney & Corbett, 2007).

2.2.2. Organizational Culture and Change Management

At the beginning of IT implementations, it became evident that the organizational culture has influence in the implementation process (Mirvis et al., 1991; Silver et al., 1995).

Davison (2002) suggests that is critical to be aware of all the cultural differences within the Organization, including the geographical perspective. It is necessary to understand the Organization characteristics and also to have conscience of all that represents a culture that would be conducive to change, in order to facilitate this process and consequently minimize the adoption costs as much as possible. Every company has a culture that may be reflected in either openness to change or the opposite way.

In the same way, the change management factor is one of the most widely cited CSF when it comes to implementing an ERP (Finney & Corbett, 2007).

The implementation of change management practices is critical due to the inevitable and significant amount of changes that occur in the organization that are provoked by the ERP project. There is a direct impact on how things are done and on how they will be done after the project implementation. Consequently that provokes resistance on the end users. Françoise (2009) claims that this is one of the most difficult management issues to deal with, in an ERP project.

Some key tasks to be done in order to minimize the resistance should be to guarantee the most of user involvement and training (Kumar et al., 2003) and to invest on the users satisfaction and positive attitude (Abdinnour-Helm et al., 2003; Ross & Vitale, 2000; Kumar et al., 2002). This can be achieved by showing the benefits and the importance of the project to the organization (Somers & Nelson, 2001, 2004; Bajwa et al., 2004; Motwani et al., 2002).

2.2.3. Business processes

- **Business process re-engineering**

ERP projects move the organizations to re-define their business processes since they have the opportunity to explore the best practices embedded in the system. This is seen

as an opportunity to make the best of the implementation and to reduce the system configuration, complexity and risk (Bingi et al., 1999; Rajagopal, 2002). One of the issues of implementing any packaged software is the gap between the company requirements and the standard features of the system (Janson & Subramanian, 1996). As such, in order to fully take advantage of the system and also not to add complexity to the project, frequently it is asked to the company to adapt itself to the ERP embedded business processes (Rajagopal, 2002).

2.2.4. Technology

- **Selection of ERP and IT infrastructure**

The selection of the specific ERP package is an important factor. The selected ERP package should have the right characteristics when fitting the overall business strategy and the organization business processes (Somers & Nelson, 2001; Chen, 2001) as well as match the organizations criteria when selecting an IS (Rao, 2000a, b). The ERP should meet the needs of the organization as much as possible in order to ensure minimal modification (Janson & Subramanian, 1996).

From the IT infrastructure side, it is also critical to understand if the organization and its IT architecture are ready to face the ERP implementation (Siriginidi, 2000a, b; Tarafdar & Roy, 2003; Somers & Nelson, 2001; Somers & Nelson, 2004; Bajwa et al., 2004). It might be necessary to upgrade the existing infrastructure (Kumar et al., 2002; Palaniswamy & Frank, 2002).

- **Software development and testing**

The activities related to the system development and testing are critical in terms of the quality of the solution that will be available to the users. The complexity involved is directly related to the degree of business processes redesign since the software must be

configured and programmed according to its standard functionalities or has to be further developed if the business processes are not covered in a standard way (Françoise et al., 2009). The effort made in the testing phase is critical and can determine the success or failure of a project (Kim et al., 2005; Gargeya & Brady, 2005). The testing exercises should happen during the final phases of the project (Kumar et al., 2002; Nah et al., 2001; Al-Mashari et al., 2003) and also simulation scenarios should take place in a pre-production basis, before running live, in order to ensure that all business processes can be delivered as expected (Yusuf et al., 2004).

- **Data analysis and conversion**

Much of the success of the project and the system is related to the level of data accuracy, achieved in the conversion process (Nah, 2006; Umble et al., 2003; Somers & Nelson, 2001, 2004; Xu et al., 2002; Bajwa et al., 2004).

Critical aspects like deciding what information should or should not be migrated into the new system are extremely relevant considering and understanding its importance or lack of it. These are critical definitions to achieve in order to have a more simple process of data conversion and migration procedure. It is common that data can come from several different legacy systems and problems in this domain can lead to important delays in the project (Nah, 2006; Bajwa et al., 2004; Somers & Nelson, 2001).

2.3. Multinational organizations

The first definition of "Multinational" that related to a corporation came in 1960 and was given by David E. Lilienthal: "corporations.... Which have their home in one country but which operate and live under the laws and customs of other countries as well" (Muchlinski & Dine 2007, p.9).

There is another definition that is seen as an economist view that has been given by N.Hood and S.Young in 1979 that says that “A "multinational enterprise" is any corporation which, "owns (in whole or in part), controls and manages income generating assets in more than one country” (Muchlinski & Dine 2007, p.9).

The OECD definition, states that:

“usually comprise companies or other entities established in more than one country and so linked that they may coordinate their operations in various ways. While one or more of these entities may be able to exercise a significant influence over the activities of others, their degree of autonomy within the enterprise may vary widely from one multinational enterprise to another. Ownership may be private, state or mixed” (Muchlinski & Dine 2007, p.10).

Given this particular definition, when entering in the ERP implementation context, it is a fact that when the project deals with multiple locations, the complexity rises substantially and there are different challenges (Markus et al., 2000).

Dimensions like business strategy, management execution, software configuration or technical platform are challenging in multisite implementations (Markus et al., 2000) and factors like language, local regulations, management style, labor skills or even politics vary across different countries and should be taken into consideration because of its importance to the success of the project (Sheu et al., 2003, 2004).

3. Methodology

3.1. Research Method

A research method involves data collection (Harging, 1987). There are many research methods in the IS area, but the most used are the qualitative and quantitative methods

and more recently, mixed methods (triangulation research) have been also used (Myers, 1997).

The present research explores both social and technical components in the integration of ERPs. As such, a qualitative method of research was used.

This research has the objective of answering the main question: considering a multinational organization, how are the CSFs for an integration of different ERP systems different from the ERP adoption scenario?

For this it was used the case study methodological approach in reference to a single organization which is implementing a new ERP system through the integration of five ERPs currently in use, into that same new ERP system. This case study involved the collection of qualitative data including twelve interviews made to a set of participants with direct responsibilities in the Project within the ten countries involved.

Case study method is a methodological approach that should be used when you are facing the need of understanding, exploring or describing events and complex contexts. Yin (2009) states that the case study approach is suitable to the research when answers as “How?” and “Why?” are looked, when the researcher deals with situations where the identification of important variables is difficult and/or complex, when is needed to relate the relevant factors to the entity, when he needs to analyze a subject that is directly accessed in a deeper way and when there is a need to understand the subjects dynamic, a program or a process (Yin, 2009). As such, Yin (2009) defines “case study” sustained on the phenomenon characteristics and also on data collection characteristics process and their analysis strategies.

A major advantage of the case study data collection is the possibility of using several sources of evidence. That possibility allows the research to address a process of

triangulation in the data evidence collection process. This process allows the corroboration on the same facts or phenomenons (Yin, 2009).

3.1.1. The Researcher

Who makes the data collection is the researcher. We can say that the validity and the trustability of the data collected depend on his sensitivity, experience and knowledge.

In this study, a great effort was made in order to reach a high level of objectivity. That included respecting the security, privacy, confidentiality and anonymously of the company in matter as well as all of the interviewed, so that they could be able to express freely their opinions and ideas.

3.1.2. Methodology stages

The methodology used in this research followed the following sequence of stages:

1 - Bibliographical Research

In this stage, there was a collection of theoretical topics about the area in question. In this stage the critical success factors which were introduced has the most representative and relevant to this research, were identified. Eleven relevant factors were introduced to support this research.

2 - Data Collection Protocol Preparation

The second stage involved all the preparation of the data collection protocol. This is one of the main factors that enhance the credibility and effectiveness of the research in a case study approach, and that represents also the advisory guide of the empirical part of the research (Yin, 2009).

There were four ways of collecting data: documentation analysis, direct observation and participant-observation (through a daily based participation on the project) and analysis of the interviews made to team members who have participated in the project. It was

also collected secondary data, extracted from journals and magazines, company's public information and its institutional website.

3 - Case Study

Following the previous stage, twelve interviews were made regarding a set of eighteen questions to participants with different profiles within the project and from the different countries involved (Appendix A). The interviews were made in presence or through videoconference and all the interviews were audio recorded and later transcribed. From these interviews, the objective was to obtain the participants perspective on what are the main factors to the success of the Beta project (integration of ERPs) and how/why are they important. An interview guide was used during the interviews. This guide was developed from the existing literature structure. The interviewed were invited to say what they think were the critical issues to the Project success.

The interviewer did not make any suggestions in order not to influence the answers, and just asked for some clarifications when some not understandable statements were made.

The interviews length went from 30 minutes to one hour. The first interview took place on July 9th 2013, and the last was recorded in July 22nd 2013. The twelve people interviewed had different profiles in the project: 1 Chief Information Officer (Portugal), 3 Project Directors (Portugal and Spain), 1 Project Manager (Portugal), 2 IT responsibles (Portugal and USA/Canada), 2 Heads of Administration Finance and Control (France/Belgium and Italy) and 3 Chief Accountants (UK, Poland and Romania). These countries represent the whole geographical scope of the project.

4 - Analysis and Data Interpretation

On this stage the data analysis and interpretation took place. The collected data was analyzed and classified as an objective to enhance the gathered knowledge, allowing

this research to have a purpose. The objective was to have a better comprehension on the interviewed speeches, extracting just the necessary data to the study. The questions asked on the interviews, its answers and also the data collected from the observation made, where crosschecked with the eleven relevant factors identified on the first stage.

5 - Results

The last stage of this study is where the results and findings are presented. The results phase has the purpose of responding to the research question. As such, it is in this stage where practical and theoretical conclusions of the research are reached, as well as the new opportunities and/or new research questions to have in consideration for future analysis.

4. Case Study

The objective of this case study is to deepen the knowledge in the process of implementing an integration of different ERPs into only one ERP system, researching the dynamic of the process of this different type of implementation to determine what factors contribute to the success of the project and how.

The company used to the case study is a Portuguese utilities multinational company that is among the largest consumers of IT in Portugal. This company will be called Alpha.

4.1. Company and characteristics

Alpha is a utilities company that has its headquarters in Lisbon. It has several subsidiaries in Portugal in several locations, and has also several subsidiaries abroad in several different countries:

Europe: Portugal, Spain, France, UK, Italy, Belgium, Poland and Romania

North America: United States of America and Canada

South America: Brazil

Asia: China

Africa: Angola

Alpha had in the year of 2012 a Turnover above 15.000 € Million and it has presently about 12.000 employees worldwide.

4.2. Project and characteristics

The Alpha Corporation has a complex organizational structure (plus than 300 companies) where any initiative or project that might be global or next to it, gets particularly complex and effort consuming in terms of its management.

The Project of integrating five different ERP systems into a new single ERP in the Alpha Company is a good example of a pretty much global initiative Project within the corporation. This Project will be called Beta. Project Beta is a part of a bigger and wider Program which has the following main goals in the Alpha Corporation: 1) to consolidate business; 2) to create value; and 3) to enhance the Group's strategy execution ability.

One of the first goals of this wide Program was to create a Corporate Shared Services that could embrace a big set of the Organizations back-office processes worldwide (except Brazil). Project Beta was setup also as a form of supporting this Corporate Shared Services from the ERP systems perspective.

Being a multinational corporation, the corporation has grown worldwide mainly through the acquirement of its subsidiaries. These companies, when acquired, had already their own ERP system. This means that Project Beta represents an integration of different ERP systems (2 ERP Systems from Portuguese companies, 2 ERP systems from Spanish companies and 1 ERP System used by all of the rest of the countries involved).

These five ERP systems are to be integrated into a new single ERP, meaning a new global ERP.

All of these ERPs (the existing five and the new to be implemented) are SAP systems.

Project Beta started in 2009 with the following main goals:

- Assure the unification and integration of support processes in functional areas: Planning & Budgeting, Eco-Fin and Human Resources at Corporation Alpha;
- Align the processes of support functional areas (Planning & Budgeting, Eco-Fin and Human Resources) with the existing best practices;
- Capitalize the standard functionalities of the new ERP system;
- Implement a robust ERP system functional architecture that would support the evolution and sustainable growth of Corporation Alpha.

The functional scope of this Project is:

- Planning and Budgeting, Ecofin, Logistics and Human Resources. The assets management processes were left to a following stage of the Project Beta.

The geographical scope of this Project is:

- Portugal, Spain, France, UK, Italy, Belgium, Poland, Romania, United States of America and Canada.

The roadmap has several deliveries in Production because its division in several functional/geographical stages of implementation. Currently, all of the ten countries involved already went live in production in at least one main functional area.

According to the roadmap/functional areas, the last Go-live date of the Project is planned to the beginning of 2017.

The achieved methodology to implement the new ERP was to define and develop a Corporate Template of processes that would represent 80% of the processes in all

geographies, giving a global unification of the processes into the corporation companies. After this definition, the solution was to be delivered to each geography and the only changes allowed to the Corporate Template were the Legal/Fiscal requirements and very few particular local needs to be approved by the Corporate System Processes Group Owners.

To give a better idea of the dimension of the project, some numbers are presented:

- Project Team = ~200 people
- 26 macro processes, with a total of ~190 processes

Besides this Corporative Team, there are several participants from each local geography from the Business side (local Process Owners) and also from IT (local Functional Coordinators). For each stage of Project Beta that starts, these local stakeholders are involved in the Project Teams accordingly.

4.3. Integration of ERP CSF

In this chapter the data analysis and the interviews content will be presented. With this analysis it is possible not only to attend the research objectives but also to compare data in order to confirm or reject the assumptions of the research. The CSFs identified previously in the literature review (to adoption of ERP) will be analyzed in the context of the integration of ERPs, considering the Alpha Company. The factors will be analyzed regarding if they are considered important and how are they important.

4.3.1. People

- **Top Management Support**

Most of the respondents have mentioned that having a strong support of the Organization's Top Management has been a very important factor in project Beta.

Being a very demanding project that brought a great deal of changes and impacts to the Organization, most of the interviewees consider that the involvement of the Top Management has been a critical factor of success. There is the idea (also confirmed by observation), that in a Project that integrates different existing ERPs, a relevant part of the projects benefit to the Organization is mostly corporative and it is not visible or applicable to the local subsidiaries or generally to the end users. As such, having strong backup and support from the Board when difficult decisions are necessary, has been a fundamental factor to the success of the Project. Having several geographies involved has been considered an additional motive to reinforce the importance of this factor.

- **Project Champion**

Most of the interviewees did not mention this factor as being one of the most important factors. Still there are some references to it:

"... An inspiring leadership makes it easier during the toughest phases of the project..." [CA – UK].

Even though some of the interviewees consider important having a strong leadership with a committed focus on the disclosure of the project and its importance, this factor was not pointed by the majority of the interviewees. When questioned why was not this one of the critical factors identified, the responses were aligned with the opinion that it is an important factor, but not one of the most important factors in project Beta.

- **Project management**

The ERP success depends in a critical way on an effective Project Management and its numerous methodologies and management tools (Somers & Nelson, 2001).

This statement included earlier in the Literature review chapter, reflects the majority of the opinions stated by the interviewees when it comes to project management criticality.

Despite that this factor has not been one of the most mentioned, the interviewees pointed the methodologies used as important aspects to guarantee that every member of the project knows its role in the project and how to do it the best way. All the usual project management abilities are to be considered, but given the amount of systems and consequently the migration tasks to do in each old system, the ability of defining carefully the project scope from the start is a truly important task regarding project Beta. Additionally, having several activities running in several geographical locations makes the management much more complex. Besides the distance, there are different cultural aspects to be managed. The USA IT responsible stated for example that *"...we are not used to have even one minute of delay in the start or at the end of a meeting and that had to be understood and very well managed in order to reduce possible resistances*..."

- **Communication plan**

The communication factor was one of the most mentioned factors by the interviewees in the Alpha Company and was pointed as being the most important factor by some. A great part of the answers refer that this factor has been absolutely critical in project Beta.

"...It´s critical to inform and to convince everyone when it comes to the projects importance and benefits. Everyone needs to know what the project is, its objectives and its roadmap. It´s fundamental that everyone knows the projects "global picture" and what it´s all about..." [CA – Poland].

Having an efficient communication plan that reaches all the project stakeholders and that gives the project objectives, importance, benefits, status, and that is also an engagement factor to all the team members to be aware of all its roles, has been stated

as fundamental in project Beta. This concern is critical since the beginning of the project until its end, with the same importance.

The IT responsible to the project in the USA mentioned that *"...sometimes the communication has failed. When that happens in a project like this, the only part of the project that people are aware and get to know is the negative part. That makes it much harder..."*

Also the fact that several geographies are involved has also been mentioned has a strong but additional motive to reinforce the importance of this factor. Having different stakeholders in ten different countries made the communication tasks critical but more complex in the day-to-day basis.

- **Project team**

To the Alpha Company, having the right team in Beta project has been considered critical. Not just having the right people, but mostly having them in a full-time basis was considered very important to the success/unsuccess of the project.

From this perspective, a multidisciplinary team was built that included different members from different business departments as well as the IT department. All the countries involved in the project had their team members, despite the fact that any of them was at a full-time basis in the project.

"...There was a natural tendency to underestimate the project because it was "just" an integration of already existing and implemented ERP systems. The outcome was that the task was at least as big as implementing them for the first time (probably even bigger) and the result was that time was not enough to accomplish the planned activities on time..." [PM].

The project showed a lot of complex challenges not only from the technical perspective, but also from the business side. Only part of the project team was in a full-time basis and that team members represented about 10% of the entire project team members involved. This was one of the critical aspects mentioned by several interviewees in the sense that the project team's allocation has revealed to be insufficient.

Regarding the consultants, the Alpha Company stated that there was a lack of seniority given the technical challenges that the project revealed. There was the idea that most of the consultants had never implemented this type of integration projects, and by that, did not had the right experience to it.

- **Training**

The training factor was the least mentioned critical factor by Alpha Company interviewees. When questioned why was not this one of the critical factors identified, the responses were aligned with the opinion that it is an important factor, but in the case of project Beta, since the selected ERP was the same as the old that they used (both SAP systems), the training was not an issue from the functional point of view since the users were already very aware of the standard functionalities. The most important part of the training was to understand how the processes changes were reflected on the system.

4.3.2. Organizational Culture and Change Management

The Alpha Company has changed significantly due to its fast growth in the past few years through the acquisition of several companies. That meant changes from the Organizational Culture point of view:

"…Because of the acquisitions, Alpha changed a lot in the last few years. Besides having some rejuvenation that was positive from the peoples innovation and availability

sides, that meant also dealing with the existing autonomy of the employees which was difficult to deal with in a project like Beta, from the resistance perspective… " [PM].

Additionally it was stated by the most of the interviewees that Alpha does not have a culture of strong corporative imposing of decisions, but more of a "reaching general agreements" one. On the other side, the several companies/subsidiaries do not have also a native culture of yielding easily to corporative decisions:

"…Alpha culture as a group does not represent a muscled decisions imposing culture, but yet a negotiation one. That makes it harder when it comes to this kind of projects..." [PD].

The general opinion, also confirmed by observation, was that this was particularly critical given the nature of Beta project that represents the integration of five already existing and different ERPs, where each system and business owner thought that its own system or process was the best:

"…It´s much more easy to implement a new ERP when you don´t yet have one, than integrating different ERPs into a single new one because everyone thinks that their own stable ERP and all its processes, configuration, etc, are the best and the more efficient..." [PD].

One other important aspect in Alpha is the geographical diversity. Project Beta was in ten different countries that represent different cultures that had to be managed:

"…In reference to the beginning phase of the project, I think that Project Beta management did not had the exact notion of the impact that the multinational factor was going to represent in a project such as this one…". [ITR– Spain].

This geographical cultural difference was considered by most interviewees as an important theme that at some point had some impact in the day-to-day basis managed:

"…The geographical cultural differences have impact because the US culture is different from the Spanish or the Portuguese and this "shock" wasn't good to the project's image in the US at the beginning. For instance, aspects like communication, punctuality, objectivity, etc., are very present in the US company culture and some lack of it was felt by the US team members as a negative point in the project..." [IT – USA].

Given all the cultural aspects stated above, the interviews revealed a high importance given to the Change Management factor. This was one of the most consensual critical factors, stated in all interviews. The common idea was that it was critical to deal and manage the changes that the Project would bring (processes and system issues).

"…It's fundamental to manage the changes and expectations in the way that everyone should understand the impact that they are going to face in order to adapt ourselves the best way possible..." [HAFC – Italy].

The need to have practices to deal with the amount of changes brought by the new ERP was mentioned as critical, also to manage in different ways:

"…From the Beta perspective, the change management was complex but in a different way due to the fact that every company has had already a previous, unique and different ERP implementation experience, so the expectations and degrees of resistance were also different. That was something that we needed to pay attention and to manage properly…" [PD].

4.3.3. Business processes

- **Business process re-engineering**

As studied earlier, ERPs move organizations to re-define their business processes.

In project Beta the processes that were already in use in each of the five old ERPs were not identified previously to the implementation of the new processes. Instead, the

approach was to define the new corporative processes (processes template) having the participation of every of the main companies involved in the project. After this definition, there was an analysis to the GAP of this corporative template regarding the five different set of processes already in place in the five different ERPs. These GAPs were analyzed and decisions were made in order to solve them.

The opinion of the interviewees regarding this approach, diverge into 2 main and opposite ideas. Part of the answers shows that it was not a critical factor in the way that the impact of the new processes was not significant at the end. The other part tells that it had been better to identify the processes from the five ERPs in the first place, and just then, define the new corporative template. This idea states that this previous identification of the As-Is, would helped to have a better notion of the existing processes in each ERP and the GAPs would have been identified in an earlier stage of the project. This would have facilitated the resolution of the identified GAPs.

In resume, despite having some changes in some processes according to the new system processes definitions, those changes were not significant. The same idea was mentioned in terms of procedures that had to be changed to manage properly those processes changes. The common idea was that the new system did not mean having to change processes or procedures in a critical way. The most significant aspect on this matter, corroborated by the observation made, was that there was a considerable set of processes that passed on to the Shared Services Center in terms of their execution.

4.3.4. Technology

- **Selection of ERP and IT infrastructure**

The selection of the ERP package should have the right characteristics when fitting the overall business strategy and the organization business processes. The ERP should meet

the needs of the organization as much as possible also to ensure minimal modification. On our interviews, this subject was broadly spoken by all the respondents. The fact that several countries and therefore, several different local and legal requirements were involved, makes this factor critical to the interviewees. It was fundamental to ensure that the ERP selected would be able to deal with these requirements and with a large set of requirement in several different business processes.

Other aspects mentioned were the importance of having an ERP that would manage several languages and that would be versatile and would have an high degree of coverage of the business processes through the standard functionalities. Scalability was also referred as an important aspect, given the size and potential of continuous growth of Alpha. Being an integration project, the level of standard functionalities coverage to the requirements presents an important aspect to consider:

"...Standardization is a more important factor in Beta being an integration project that it would be in a first/single implementation..." [PD].

- **Software development and testing**

The activities related to the system development and testing are critical in terms of the quality of the solution that will be available to the users and even can determine the success or failure of a project (Kim et al., 2005; Gargeya & Brady, 2005).

The answers given on the interviews are also aligned with this idea. Even though not all respondents have mentioned this factor when it comes to the technological critical factors in project Beta, the answers that where given show its criticality. A particular aspect referred by some was the importance of having certain checking points during the development phases, particularly when specific not standard developments are at stake, in order to avoid miss understandings in the alignment between the presented

requirements and the delivery of the solution. The involvement of the Business side (Testers or key-users) in the development phase, previously to the delivery, was considered important by Alpha.

Another issue was the team's lack of knowledge about the local and legal requirements (particularly the consultants) of the majority of the ten countries at stake. The respondents that had not mentioned this factor on their answers shared that this factor is very important but they feel that being important, they did not feel the need to refer it.

- **Data analysis and conversion**

From the technological perspective, this was the most mentioned and the most important factor to Alpha Company regarding the Beta project.

Much of the success of the project is related to the level of data accuracy, achieved in the conversion process. This is absolutely critical when five different systems integration is at stake. That was the common idea shared by the respondents:

"…Converting and validating all the data to be migrated to the new ERP was and still is truly complex because we face different systems and big volumes…." [PD].

"…To be able to convert concepts from different systems and to be able to keep the same data quality when we have many thousands of data, has been an enormous task and that represented a complexity multiplier to the project..." [ITR – Portugal].

A common idea (corroborated also by the observation made), was that part of this complexity was related to the fact that having already ERPs implemented and although the new ERP selected was SAP also, that made more difficult the conversion process. The task of concentrating similar business concepts (but not equal) into new concepts into a single ERP requires a careful and difficult work because mistakes or misunderstandings can easily happened, leading to a wrong data migration:

"…Although the new ERP was also SAP, the fact that all companies already had a SAP system implemented made the integration more difficult. We were expecting exactly the opposite…!" [PD].

From the pure technological perspective, the general opinion was that migrating to an also SAP system has facilitated the task but also lead to more serious conversion/migration mistakes because concepts and fields that where used in the old ERPs were misunderstood regarding the new ERP (because of the pre-defined knowledge and mindset oriented to the old SAP). From the business perspective that requires a great deal of attention because the same field/concept might have small but very important differences between the old and the new ERPs.

Additionally, having already ERPs in place makes the task harder in terms of the new definitions to be made in the new system concepts. This has to do with data property. The resistance to give up what one already has, when the future ERP is the same, is truly difficult to handle:

"…There has been a big resistance to change when it comes to system ERP concepts, because we are facing an integration project. I believe that if no one knew already the ERP system concepts, it would have been easier to everyone to concede…" [PM].

Finally, having good knowledge from all the legacy systems and having a careful definition to the migration strategy have been pointed as important factors also on this matter and regarding Beta project.

4.4. Results Overview

A resume of the results, comparing the Alpha case study with the Literature Review, is presented in Table I:

Table I: Comparison between Critical Success Factors from the literature and found in the Alpha Company (Beta Project).

People		**Organizational Culture**		**Business Processes**		**Technology**	
Critical Success Factors		Critical Success Factors		Critical Success Factors		Critical Success Factors	
Literature	Alpha Company	Literature	Alpha Company	Literature	Alpha Company	Literature	Alpha Company
Top Management Support -> ERP adoption transforms the organizations and such a project must be clearly and strongly supported by the top management.	Strong support is a very important factor because the benefit is not visible or applicable to the majority of the project stakeholders.	Organizational Culture -> critical to be aware of the cultural and geographical differences within the Organization and understand its characteristics that that would be conducive to change.	Alpha does not have a culture of strong corporative imposing of decisions; Each country has different culture aspects that have to be identified and carefully managed.	Business process re-engineering -> ERP adoptions move the re-definition of the business processes giving the opportunity to explore the best practices embedded in the system.	Not critical since there were not many process changes that were needed. Having already ERPs implemented, the potential to explore the system practices is more reduced.	Selection of ERP and IT infra-structure -> The selected ERP package should fit the overall business strategy and the organization business processes.	Critical to ensure that the new ERP responds to every country specific and legal requirements and processes.
Project Champion -> A facilitator and a team motivator that has the important role of	Despite beeing an important factor, it was not considered one of the most critical factors in the Beta Project.	Change Management Critical due to the inevitable and	Integrating five existing ERPs means a specific kind of resistance because everyone			Software development and testing -> system development and	Despite beeing an important factor, it was not considered one of the most critical

People		Organizational Culture		Business Processes		Technology	
Critical Success Factors		Critical Success Factors		Critical Success Factors		Critical Success Factors	
Literature	Alpha Company	Literature	Alpha Company	Literature	Alpha Company	Literature	Alpha Company
creating enthusiasm, and converge the team into the same common goals.		significant amount of changes that occur in the organization that are provoked by the ERP adoption.	thinks that their own former ERP is the best.			testing are critical in terms of the quality of the solution that will be available to the users.	factors. Having some check points during the execution the developments is important to unsure alignment.
Project Management -> consists on the definition and execution of all the activities that will make possible the insurance that the implementation will occur as planned.	Several systems to migrate involve having very strong abilities (bigger attention) in the definition of the scope. Having several geographies, involve complexity that requires stronger methodologies.					Data analysis and conversion -> Much of the success of the project and the system is related to the level of data accuracy, achieved in the conversion process.	Very critical because of the integration of different ERPs. Having ERPs already in place makes the conversion process more difficult. Issues of system ownership are a complexity multiplier as they are a particular resistance factor.
Communication Plan -> The key messages of the project, its goals and	Needs a special focus because the benefits of such project are not easily understood and						

People		Organizational Culture		Business Processes		Technology	
Critical Success Factors		Critical Success Factors		Critical Success Factors		Critical Success Factors	
Literature	Alpha Company	Literature	Alpha Company	Literature	Alpha Company	Literature	Alpha Company
expectations, must be communicated among the entire project stakeholders.	visible to most people. Having several geographies makes communication more complex and fundamental.						
Project Team -> should have the best skills within the organization and its elements should be allocated to the project in a full-time basis.	Critical factor that should be given even more attention due to the natural tendency to underestimate the project complexity.						
Training -> critical matter in an ERP adoption project; Very complex, and it should be rigorous.	It is not one of the most important factors because the ERP selected is the same as the current ERP software (SAP).						

5. Conclusions and further studies

This research aims to improve the understanding on how the CSFs for an integration of different ERPs, are different from the CSF for an ERP adoption, considering a multinational environment.

In this study, the most critical CSFs to an ERP adoption were identified (within Business Processes, People, Technology and Organizational Culture). This study, managed to identify the eleven most critical success factors regarding ERP adoption, based on a review of the related literature. These factors and the way how they are critical were compared with an integration of ERPs scenario. This analysis becomes more relevant as time goes bye given the fact that many Corporations and its ERPs have today a considerable higher degree of maturity and the type of implementations that they face, is different from the adoption of the ERP once it happened. This is the case of the Alpha Company. Alpha is an example for a multinational corporation where the integration of new subsidiaries that already had ERPs implemented, had to manage and implement an integration of different ERPs into a single new one.

Supported by the referred theoretical research, this study compared its results with the interviews made to the Alpha's implementation project team of the integration of different ERPs. It is fundamental to understand to what extent the organization's limited resources should be applied to the same factors (and in the same way) as an ERP adoption, in such projects. The Alpha Company shows that despite all the factors remain important, there are some factors that are considered not as critical (Training and Project Champion factors) and others are referred as being more critical than in a project of ERPs adoption. The most relevant conclusion is the perception that in some of the most pointed critical factors in Alpha, the reasons and the reality behind that criticality

is different. These micro-level different needs and its conclusions are valuable findings, in the way that they should be taken in consideration in such projects allowing Organizations to put all their effort and investment the best way possible, driving and ensuring the most success and efficiency possible, in this different type of projects.

If we look at the example of Change Management where one could think that it could be less critical than in an adoption scenario, we realize that having already ERPs in place means a great challenge in terms of shifting people's minds into to a new ERP, against to what might be the opposite expectations on this matter. This was seen also and in the same way regarding Business processes re-engineering where having already an ERP made the resistance do re-designing into a new ERP, much bigger. Having not implemented an ERP yet, apparently allows a cleaner mind to define the new processes in the new ERP. On the opposite way, Alpha showed that having ERPs already implemented, forces to a bigger resistance to re-design into a new and integrated/corporative process.

Another example is the data conversion. The fact that an ERP was already in place could lead to the idea that it would be a simpler task, but Alpha showed that it is in fact harder. The similarity between the logic of old and new ERPs, makes it simpler from the technological perspective, but makes it in fact harder from the conceptual and business side. This is due to the difficulty in converting concepts that may look similar but in fact, are not, and doing it without misleads and mistakes. This was seen on Alpha.

Another relevant conclusion is that being a multinational company, there are some factors that gain even more importance and/or get more complex and should be paid more attention. Having several geographies, makes the project management more complex and demanding and also makes more critical the need of a strong support from

the Top Management. It is also fundamental to have an efficient communication plan that minimizes the existing distance between the different project sites. From the technical perspective, the development gets more difficult because there is a bigger diversity of local and legal requirements to face. Finally, the organizational culture that represents a multinational organization means dealing with different cultures and different ways of doing things. These differences should be carefully managed.

Having these conclusions, it is also relevant to mention some limitations of this research. In this case study the new system and the five ERPs to be integrated were all SAP. As such, it was not possible to study scenarios with different softwares. Future research should focus on if and how these critical factors differ among an integration of ERPs, in such scenarios where the softwares are not similar.

The Beta project has been setup with a roadmap that has several go-lives in different timings for different functional areas. That limited the contribution of some of the participants of Alpha, since their companies were yet at an initial stage of the project. Further studies should also focus on if and how these critical factors differ according to the stage of the project and according to the functional area in stake.

Bibliography

Abdinnour-Helm, S., Lengnick-Hall, M.L. and Lengnick-Hall, C.A. (2003). Pre-implementation attitudes and organizational readiness for implementing an enterprise resource planning system. *European Journal of Operational Research*, 146, 258-73.

Al-Mashari, M., Al-Mudimigh, A. and Zairi, M. (2003). Enterprise resource planning: a taxonomy of critical factors. *European Journal of Operational Research*, 146, 352-64.

Al-Mashari, M., Irani, Z. and Zairi, M. (2001). Business process re-engineering: a survey of international experience. *Business Process Management Journal*, 7(5), 437-55.

Ang, J.S.K., Sum, C.-C. and Yeo, L.-N. (2002). A multiple-case design methodology for studying MRP success and CSFs. *Information and Management*, 39(4), 271-81.

Bajwa, D.S., Garcia, J.E. and Mooney, T. (2004). An integrative framework for the assimilation of enterprise resource planning systems: phases, antecedents, and outcomes. *Journal of Computer Information Systems*, 44, 81-90.

Bingi, P., Sharma, M.K. and Godla, J. (1999). Critical issues affecting an ERP implementation. *Information Systems Management*, 16, 7.

Boynton, A. C., and R. W. Zmud. (1984). An assessment of critical success factors. *Sloan Management Review*, 25(4), 17–27.

Chang, M., W. Cheung, C. Cheng, and J. H. Y. Yeung. (2008). Understanding ERP system adoption from the user's perspective. *International Journal of Production Economics*, 113(2), 928–942.

Chen, I.J. (2001). Planning for ERP systems: analysis and future trend. *Business Process Management Journal*, 7, 374.

Clemons, C. (1998). Successful Implementation of an Enterprise System: A Case Study. *Proceedings of the Americas Conference on Information Systems*, (pp. 109-110). Baltimore, Maryland.

Deshmukh, A. (2006). Digital Accounting: The Effects of the Internet and ERP on Accounting. *Hershey, PA: Idea Group Publishing; IRM Press.*

Esteves, J. and Pastor, J.A. (2002a). A framework to analyse most critical work packages in ERP implementation projects. *Proceedings of the ICEIS 2002*, (1, 89-98). Ciudad Real.

Esteves, J.E. and Pastor, J.A. (2002b). Understanding the ERP project champion role and its criticality. *Proceedings of the European Conference on Information Systems*, June, Poland.

Falkowski, G., P. Pedigo, B. Smith, and D. Swanson (1998). A Recipe for ERP Success. *Beyond Computing*, September, 44-15.

Finney, S., and M. Corbett. (2007). ERP implementation: A compilation and analysis of critical success factors. *Business Process Management Journal,* 13(3), 329–347.

Françoise, O., Bourgault, M., & Pellerin, R. (2009). ERP implementation through critical success factors. *Management. Business Process Management Journal*, 15(3), 371–394.

Gargeya, V.B. and Brady, C. (2005). Success and failure factors of adopting SAP in ERP system implementation. *Business Process Management Journal,* 11(5), 501-16.

Grabski, S. V., S. A. Leech, and A. Sangster. (2007). Complementary controls and ERP implementation success. *International Journal of Accounting Information Systems*, 8(1), 17–39.

Grabski, S. V., Leech, S. A., Schmidt, P. J. (2011). A review of ERP research: A future agenda for accounting information systems. *Journal of Information Systems*, 25(1), 37-78.

Gupta, A., (2000). Enterprise resource planning: The emerging organizational value systems. *Industrial Management & Data Systems*, 100(3), 114–118.

Holland, P., Light, B. and Gibson, N. (1999). A critical success factors model for enterprise resource planning implementation. *Proceedings of the 7th European Conference on Information Systems*, 1, 273-97.

Howell, T. M. (2010). Critical Success Factors Simplified; implementing the powerful drivers of dramatic business improvement. Ed. New York: T. &. Group.

Janson, M. A. and Subramanian A. (1996). Packaged Software: Selection and Implementation Policies. *INFOR*, 34(2), 133-151.

Jarrar, Y.F., Al-Mudimigh, A. and Zairi, M. (2000). ERP implementation critical success factors – the role and impact of business process management. *Proceedings of the International Conference on Management of Innovation and Technology*, (pp. 122-7). Singapore.

Kang, D., and R. Santhanam. (2003). A longitudinal field study of training practices in a collaborative application environment. *Journal of Management Information Systems*, 20(3), 257–281.

Kelley, H., Compeau, D., Higgins, C., (1999). Attribution analysis of computer self-fficacy. *Proceedings of AMCIS.*

Kim, Y., Lee, Z. and Gosain, S. (2005). Impediments to successful ERP implementation process. *Business Process Management Journal*, 11(2), 158-70.

Kumar, V., Maheshwari, B. and Kumar, U. (2002). ERP systems implementation: best practices in Canadian government organizations. *Government Information Quarterly*, 19, 147-72.

———, and ———. (2003). An investigation of critical management issues in ERP implementation: empirical evidence from Canadian organizations. *Technovation*, 23(10), 793-807.

Markus, M.L.; Tanis, C; and van Eenema, PC. (2000). MultiSite ERP implementations. *Communications of the ACM*, 43(4), 42-46.

Mirvis, P. H., Sales, A. L., & Hackett, E. J. (1991). The Implementation and Adoption of New Technology in Organizations: The Impact on Work, People, and Culture. *Human Resource Management*, 30(1), 113-139.

Motwani, J., Mirchandani, D., Madan, M. and Gunasekaran, A. (2002). Successful implementation of ERP projects: evidence from two case studies. *International Journal of Production Economics*, 75, 83.

Muchlinski, P. and Dine J., (2007), Enterprises and the law. *The School of Oriental and African Studies and Cetre for Comercial Law studies - University of London*. Queen Mary.

Murray, M., and G. Coffin. (2001). A case study analysis of factors for success in ERP system implementations. *AMCIS 2001 Proceedings*, Paper 196.

Myers, M. D. (1997). Qualitative Research in Information Systems. *MIS Quarterly*, 21(2), 241-242.

Nah, F.F-H., Lau, J.L-S. and Kuang, J. (2001). Critical factors for successful implementation of enterprise systems. *Business Process Management Journal*, 7, 285.

Nah, F., and Delgado, S. (2006). Critical Success Factors for Enterprise Resource Planning Implementation and Upgrade. *Journal of Computer Information Systems* (46), 99-113.

Palaniswamy, R. and Frank, T.G. (2002). Oracle ERP and network computing architecture: implementation and performance. *Information Systems Management*, 19, 53.

Rajagopal, P. (2002). An innovation-diffusion view of implementation of enterprise resource planning (ERP) systems and development of a research model. *Information and Management*, 40(2), 87-114.

Rao, S., (2000a). Enterprise resource planning: Business needs and technologies. *Industrial Management & Data Systems,* 100(2), 81–88.

Rao, S., (2000b). Enterprise resource planning: Business needs and technologies. *Industrial Management & Data Systems,*100(2), 81–88.

Robey, D., J. W. Ross, and M. C. Boudreau (2002). Learning to implement enterprise systems: An exploratory study of the dialectics of change. *Journal of Management Information Systems,* 19(1), 17–46.

Rockart, J. F. (1979). Chief Executives Define Their Own Data Needs. *Harvard Business Review*, 52(2), 238-241.

Rosario, J,G, (2000). On the Leading Edge: Critical Success Factors in ERP Implementation Projects. *Business World May 17*, p. 27. Philippines.

Ross and M. R. Vitale. (2000). The ERP revolution: Surviving vs. thriving. *Information Systems Frontiers*, 2(2), 233–241.

Ryan, H. W. (1999). Managing Development in the Era of Large Complex Systems. *Information Systems Management*, 16(2), 89-91.

Scott, J. E. (1999). The Foxmeyer Drugs' bankruptcy: Was it a failure of ERP? *AMCIS Proceedings*, Paper 80.

Sein, M. K., R. P. Bostrom, and L. Olfman. (1999). Rethinking end-user training strategy: Applying a hierarchical knowledge-level model. *Journal of End User Computing*, 11(1), 32–39.

Shanks, G. and Parr, A. (2000). A model of ERP project implementation. *Journal of Information Technology*, 15, 289-303.

Shanks, G., A. Parr, B. Hu. B. Corbitt T. Thanasankit, and P. Seddon (2000). Differences in Critical Success Factors in ERP Systems Implementation in Australia and China: A Cultural Analysis. *Proceedings of the 8th European Conference on Information Systems.* Vienna, (pp. 537- 544). Austria.

Sheu, C., Chae, B. and Yang, C-L. (2004). National differences and ERP implementation: issues and challenges. *Omega*, 32, 361–371.

Sheu, C., Yen, H.R. and Krumwiede, D.W. (2003). The effect of national differences on multinational ERP implementation: an exploratory study. *TQM & Business Excellence*, 14(6), 641–657.

Silver, M. S., Markus, M. L., & Beath, C. M. (1995). The Information Technology Interaction Model: A Foundation for the MBA Core Course. *MIS Quarterly*, 19(3), 361-390.

Siriginidi, S.R. (2000a). Enterprise resource planning: business needs and technologies. *Industrial Management & Data Systems*, 100, 81.

Siriginidi, S.R. (2000b). Enterprise resource planning in reengineering business. *Business Process Management Journal*, 6, 376.

Somers, T. M., and K. G. Nelson (2001). The impact of critical success factors across the stages of enterprise resource planning implementations. *34th Annual Hawaii International Conference on System Sciences.*

———, and ———. (2003). The impact of strategy and integration mechanisms on enterprise system value: Empirical evidence from manufacturing firms. *European Journal of Operational Research* 146(2), 315–338.

Tarafdar, M. and Roy, R.K. (2003). Analyzing the adoption of enterprise resource planning systems in Indian organizations: a process framework. *Journal of Global Information Technology Management*, 6, 31.

Tinham, B. (2006). Your guide to choosing and implementing ERP. *Manufacturing Computer Solutions*, 12(6), 9-13.

Umble, E.J., Haft, R.R. and Umble, M.M. (2003). Enterprise resource planning: implementation procedures and critical success factors. *European Journal of Operational Research*, 146, 241-57.

Wee, S. (2000). Juggling toward ERP Success: Keep Key Success Factors High. *ERP News. February, 2000.*

Xu, H., Nord, J.H., Brown, N. and Nord, G.D. (2002). Data quality issues in implementing an ERP. *Industrial Management & Data Systems*, 102, 47.

Yin, R.K. (2009). *Case Study Research: Design and Method,*. 4th Ed. Thousand Oaks, CA: Sage.

Yusuf, Y., Gunasekaran, A. and Abthorpe, M.S. (2004). Enterprise information systems project implementation: a case study of ERP in Rolls-Royce. *International Journal of Production Economics*, 87, 251-66.

Zhang, Z., Lee, M.K.O., Huang, P., Zhang, L. and Huang, X. (2005). A framework of ERP systems implementation success in China: an empirical study. *International Journal of Production Economics*, 98(1), 56-80.

Appendix

Appendix A: Questions guide - Set of questions made in the interviews

Interview objectives: To acquire knowledge in the integration of ERPs context and the approaches adopted in order to achieve the success in the system implementation.

• For how long do you work in the Alpha Company?

• What was/is your position in the company during your participation in the Project?

• When did you participated in the Project and what are the Project motivations that you are aware of?

Critical Success Factors in the implementation

Organizational culture

• Could you please describe your Organizational Cultural in detail and tell at what extent and how that Organizational cultural influenced the success/unsuccess of the implementation of the new ERP system?

• What would you say is the importance of the Organizational culture in the success of the integration of different ERPs into a single ERP? Could you explain why?

Processes

• If we go back to the period prior to the integration of ERPs, would you say that there was the need of re-designing any business processes? Could you describe why and give an example?

• Have the current processes been identified prior to the beginning of the ERPs integration? Do you think that might have been an important factor to the success/unsuccess of the new ERP implementation?

• Was it necessary to change any procedures? How was that made? Could you give an example? Do you think that might have been an important factor to the success/unsuccess of the new ERP implementation?

• The new ERP system affects a great deal of departments and countries in the Alpha company. At what extent do you think that the integration between these different departments and countries is to the success of the new ERP project? Could you explain why?

People

• Considering all the human resources involved in the project, what are the factors that you consider that have been the most critical to the project success? Could you explain why?

• (select the factors that have not been mentioned)

- Top Management Support
- Project Champion
- Project Management
- Change Management
- Communication Plan
- Project Team
- Training

• (in regard to the factors that have not been mentioned) Why didn't you mentioned these factors? Why do you think they are not critical or not as critical?

• From your previous answers, do you think that Alpha being a Multinational company had some influence on your choices? Why?

Technology

• Considering the technological aspects involved in the project, what are the factors that you consider that have been the most critical to the project success? Could you explain why?

• (select the factors that have not been mentioned)

- IT infrastructure and selection of ERP

- Software development and testing

- Data analysis and conversion

• (in regard to the factors that have not been mentioned) Why didn't you mentioned these factors? Why do you think they are not critical or not as critical?

• From your previous answers, do you think that Alpha being a Multinational company had some influence on your choices? Why?

Multinational

• Do you think that Alpha being a multinational company, that changes the CSF in the Project? If so, what are the most relevant aspects and why?

• Could you give some examples of important aspects that where considered in the project that were related to the existence of several countries in the project?

General

• If you would have to rank the main factors: Human Resources, Business Processes, Technology and Organizational Culture considering its importance to the success of the Project, how would you do it and why?

• Is there any other factor or comment that you consider important and that might have not been covered in our interview? Why are they important?